



NTSB National Transportation Safety Board

Office of Aviation Safety

Operations

Bombardier CRJ-200

Pinnacle Airlines

Traverse City, Michigan

April 12, 2007

Weather Information

- Flight delayed and nearly cancelled because of wind at Traverse City
- 10-knot tailwind limit
- Flight allowed to proceed after updated forecast

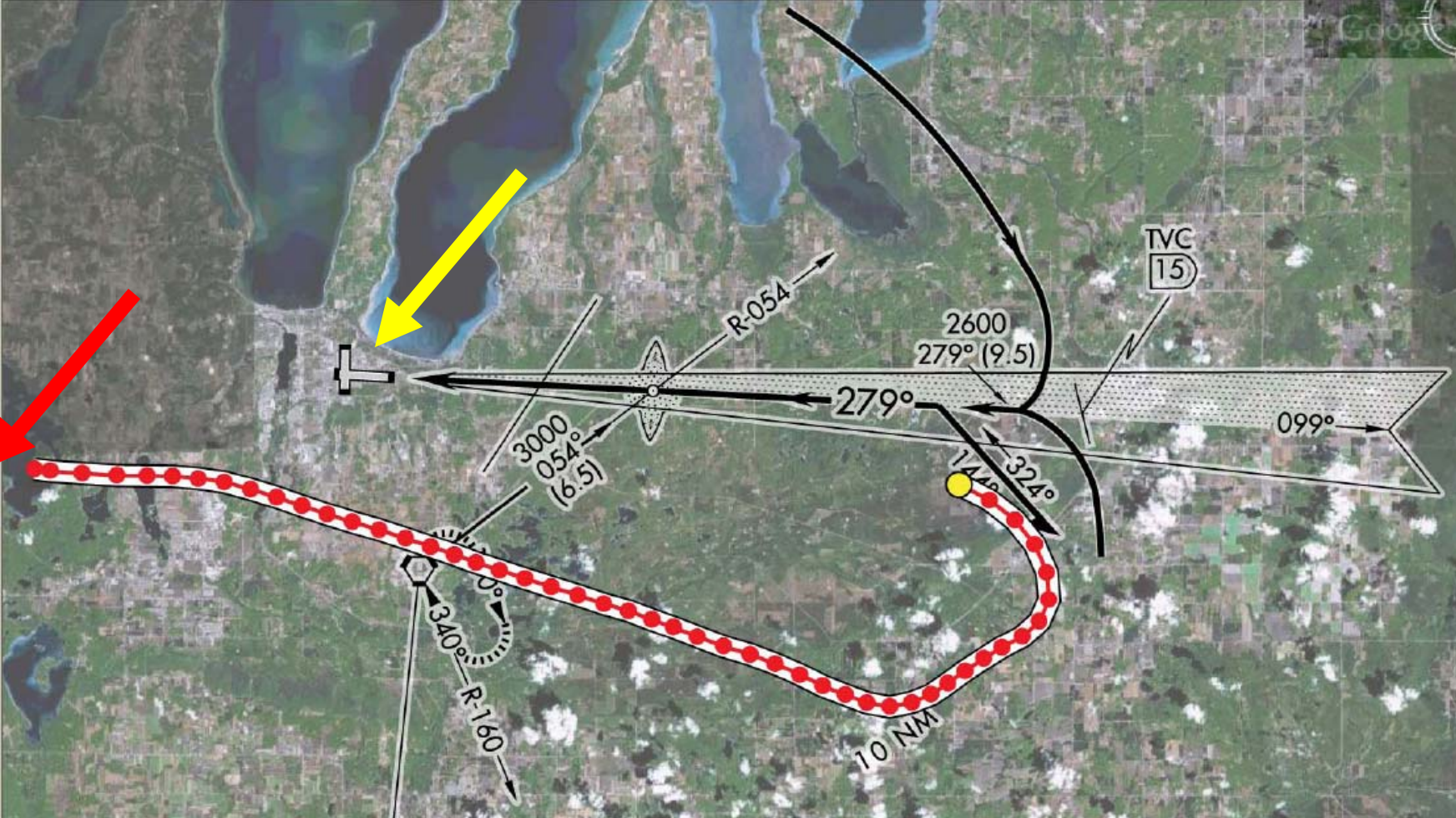
Weather Information

- Pilots checked weather several times en route
- Weather about 45 minutes before landing
 - IFR conditions with light snow
 - Winds decreasing

Weather Information

- ASOS updated at 1-minute intervals and broadcast continuously
- Pilots only monitored ASOS once, about 37 minutes before landing

Communications



Communications

- Two braking action “nil” reports
- Company prohibits landings on runways in “nil” conditions
- Pilots missed first “nil” report
- Received “probably nil” report second time

Safety Alert for Operators (SAFO)

- SAFO 06012 issued August 2006
- Urged operators to assess landing distances, based on the actual conditions at time of arrival
- Added safety margin of at least 15 percent
- Most adverse braking action report or runway condition report must be used

Landing Distance Assessment

- December 2006, Pinnacle required landing distance assessments
- In effect at time of accident
- Required pilots to determine whether adequate runway length available before beginning approach to contaminated runway

Landing Distance Assessment

- Captain familiar with procedure
- Briefed to first officer on earlier flight
- Did not perform prior to accident

Landing Distance Assessment

- Captain landed on snowy runways many times
- Believed runway conditions okay based on contamination depth
- Learned that snow had accumulated to about $\frac{1}{2}$ inch
- Told first officer allowed 3 inches

Landing Distance Assessment

- Captain understood runway was contaminated
- Pinnacle's landing distance charts would have shown that runway length inadequate

Landing Distance Assessment

Type of contaminant	Stopping margin relative to runway end plus 15% safety margin
Compacted snow	257 feet
Loose snow	-851 feet
Standing water/slush	-966 feet
Ice	-3,003 feet

Landing Distance Assessment

- Pilots could have performed landing distance assessment
- Workload relatively light
- Pilots could have delayed initiation of approach, if necessary



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